GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: April 5, 1979

Project Title: Phosphoric Acid Production from Low Grade Rock, Bench Scale Feasibility Test.

Project No: E-19-679 Green card

Project Director: E. M. Hartley

Sponsor: Gardinier, Inc.

Sept 2nd 79

Agreement Period: From 4/15/79 Until 6/14/79

Type Agreement: P. O. No. 21721

Amount: $6,232

Reports Required: As Requested

Sponsor Contact Person (s):

Technical Matters

Contractual Matters
(thru OCA)

Mr. Tas Kouloheris
Gardinier, Inc.
P. O. Box 3269
Tampa, Florida 33601

Defense Priority Rating: N/A

Assigned to: Chemical Engineering (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director--EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
Reports Coordinator (OCA)
Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION

Date: 10/6/80

Project Title: PHOSPHORIC ACID PRODUCTION FROM LOW GRADE ROCK, BENCH SCALE FEASIBILITY TEST.

Project No: E-19-679

Project Director: E.M. HARTLEY

Sponsor: GARDINIER, INC.

Effective Termination Date: 9/30/79

Clearance of Accounting Charges: 9/30/79

Grant/Contract Closeout Actions Remaining:

- X Final Invoice ~~and Closing Documents~~
- _ Final Fiscal Report
- _ Final Report of Inventions
- _ Govt. Property Inventory & Related Certificate
- _ Classified Material Certificate
- X Other Mr. R. P. Dobb-ROI Follow-up

Assigned to: CHEMICAL ENGINEERING (School/~~Laboratory~~)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director--EES
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Library, Technical Reports Section
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Project Code (GTRI)
Other OCA RESEARCH PROPERTY COORDINATOR

CA-4 (1/79)

GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332

SCHOOL OF
CHEMICAL ENGINEERING

September 28, 1979

Mr. Tas Kouloheris
Gardinier, Inc.
P.O. Box 3269
Tampa, Florida 33601

Dear Mr. Kouloheris:

The work done since our last report is covered herein. We have made some progress. The previous high for conversion of rock P_2O_5 to water soluble P_2O_5 in acidulate was 29% (acidulation efficiency). By increasing surface area of rock, better heating arrangements, and going to a hand mixer and blender, this conversion has been increased to 42 - 66%. Although most of our work has been concentrated on acidulation efficiency we have also raised the extraction efficiency to 57% as compared with a high of 26.5% in last report. From our experience and observation I believe we can obtain a further increase in P_2O_5 recovery; we have a couple of ideas that I believe will work. I believe it would be beneficial if you and Herb Clausen could visit us here at Tech to discuss our procedures and future plans. Let me know your opinion after you've looked at the attached data.

Sincerely,

Ed Hartley

EMH/jc

Enclosure

to Mr. Clement
G-Ga Tech File

Run	Grams of rock	Grams of 96.0% sulf. acid	Grams methanol	Acidulate: Grams acidulate	Acidulate: % P_2O_5 total	Acidulate: % P_2O_5 water sol.	Acidulate: % Acidulation Efficiency	Acidulate: grams total P_2O_5	Acidulate: grams water sol. P_2O_5
15	150	71.84	-	-	5.41 4.73 5.10	2.30 2.41 2.40	42.5 51.0 47.1		
16	150	71.84	-	-	5.92 5.87 5.00	2.71 2.64 2.20	45.8 45.0 44.0		
19	200	95.78	139.5	23.25	4.51	2.53	56.1	1.0486	0.5882
20	150	71.84	-	-	6.30	2.00	31.7		
21	?	?	?	?	4.95	3.3	66.7		

Duplicate analysis by Yvette
Analysis by Roy; citrate sol. > 1.0%
Duplicate analysis by Yvette
Analysis by Roy; citrate sol. > 1.0%
This run by [redacted] Dr. Roy

Run	Product Phos. Acid: grams phos. acid	Product Phos. Acid: % P_2O_5	Product Phos. Acid: grams P_2O_5	% Extraction Efficiency	% overall P_2O_5 recovery
15					
16					
19	8.84	3.79	0.335	57.0	31.94
20					
21	?	?	?	?	25.0

NOTES

1. Analysis by Yvette of acidulate supplied by Dr. Roy [redacted] from run he made on Gardinier's rock that was dried.

	% P_2O_5 total	% P_2O_5 water sol.	% Acidulation Efficiency
Yvette's analysis	3.41	3.20	93.8
Dr. Roy's [redacted] analysis	3.38	3.15	93.2

2. Repeat analysis of Run 11. Analyses were corrected based on analysis of standard rock sample. Original Run 11 and standard rock analyses were reported July 23, 1979.

	Acidulate		
	% P_2O_5 total	% P_2O_5 water sol.	% acid. efficiency
Run 11 as reported July 23	3.41	0.99	29.0
Repeat analysis of Run 11	3.28	0.95	29.0

3. Runs 15 & 16: mixing bowl was insulated; bowl and mixer blades were heated to 110°C; rock was separated into bits. Not extracted because purpose was to improve acidulation efficiency. Used hand mixer instead of platform mixer.

4. Run 19-21 used a blender instead of a mixer. Run 21 was made by [redacted] Dr. Roy.

5. Calcium and magnesium were determined on a sample of the product phos. acid: Ca = 0.25 PPM and Mg = 15.83 PPM. We've had problems with analyses of iron and aluminum using a combination lamp on the atomic absorption unit.